

## CLAIMS

We claim:

1. A variable reluctance motor comprising:  
at least one first phase module and at least one corresponding second phase module  
said first phase module positioned opposite and spaced from said corresponding second  
phase module;  
a stator extending between said first and second phase modules and  
at least one stator positioning system configured to adjust the position of said stator  
relative to said first and second phase modules such that the level of noise produced by  
said motor is adjusted.
2. The variable reluctance motor of claim 1 wherein said first and second phase  
modules each comprise a generally C shaped core, each said core including a wire  
positioned about said core such that magnetic flux is propagated through said core when  
current flows through said wire.
3. The variable reluctance motor of claim 1 wherein said stator is spaced from said  
first and second phase modules by corresponding air gaps said air gaps changing size as  
the position of the stator is adjusted, thereby adjusting the level of noise produced by said  
motor.
4. The variable reluctance motor of claim 1 wherein said positioning system  
comprises at least one shaft and at least one positioning member configured to contact said  
stator such that the position of said stator relative to said phase modules is adjusted.

5. The variable reluctance motor of claim 4 wherein said positioning phase modules comprise stator guide bearings, said stator guide bearings being rotatable relative to said stator.

6. The variable reluctance motor of claim 4 wherein said at least one shaft is flexible, and wherein said positioning system includes at least one shaft flexing member contacting said at least one shaft such that a flexing force is exerted on said at least one shaft.

7. The variable reluctance motor of claim 6 wherein said at least one shaft comprises a central portion and a plurality of end portions extending from said central portion, said end portions having diameters less than that of said central portion.

8. A variable reluctance motor comprising:

at least one phase comprising first and second phase modules, said first and second phase modules positioned opposite and spaced apart from each other;

a stator extending between said first and second phase modules such that a gap is formed between said stator and each opposing phase modules; and

at least one positioning system configured to contact and move the stator to adjust the size of said gaps thereby adjusting the level of noise produced by the motor.

9. The variable reluctance motor of claim 8 wherein said first and second opposing phase modules are positioned on opposite sides of said stator.

10. The variable reluctance motor of claim 9 wherein each said phase module, comprises a generally C-shaped core and a wire positioned about said generally C-shaped core such that magnetic flux is propagated through said generally C-shaped core when current flows through said wire.

11. The variable reluctance motor of claim 8 further comprising flexible bearing shafts, each of said flexible bearing shaft supporting a corresponding pair of stator bearings.

12. The variable reluctance motor of claim 11 wherein said flexible bearing shafts further include a screw for adjusting the position of each said shaft and the position of said stator relative to said first and second opposing phase modules.

13. A method of reducing the level of noise created by a variable reluctance motor during operation, said method comprising the steps of:

providing an electrical current to a pair of phase modules of a first phase unit, one of said phase modules being on an opposite side of a stator from the other phase modules and forming part of an opposing phase module;

determining if the distance between each phase module and the stator is equal; and, if necessary,

adjusting the distance between each phase module and the stator until the distances are equal.

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14. The method of reducing the level of noise created by a variable reluctance motor according to claim 13 wherein the steps of claim 13 are repeated for further including the step of applying an electrical current to a pair of coils of a second phase unit spaced from said first phase unit.

15. The method of reducing the level of noise created by a variable reluctance motor according to claim 13 wherein said determining step includes the step of measuring the noise level of the motor.

16. The method of reducing the level of noise created by a variable reluctance motor according to claim 14 wherein said adjusting step includes the step of changing a position of a plurality of positioning phase modules in contact with said stator.

17. The method of reducing the level of noise created by a variable reluctance motor according to claim 21 wherein said changing step includes advancing a threaded member into a shaft carrying at least a pair of said positioning phase modules.

18. A method of adjusting a variable reluctance motor in order to reduce a level of noise generated by said motor, said method comprising the steps of:

measuring an inductance of each of a pair of opposing coils in a phase unit of the motor; and

mechanically adjusting a distance between each phase module of said phase units and a stator positioned between said phase modules to achieve the same inductance in each of said coils.